

Dave Wham

WHITE RIVER SHALE OIL CORPORATION

PROJECT FIELD OFFICE
P.O. BOX 790040
VERNAL, UTAH 84079
(801) 789-7721



March 20, 1986

RECEIVED
MAR 24 1986

DIVISION OF
OIL, GAS & MINING

Mr. Lowell P. Braxton
Administrator, Mineral Resource
Development and Reclamation Program
State of Utah Natural Resources,
Oil, Gas and Mining
355 W. North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

ACI 1047 / 017

Dear Mr. Braxton:

Enclosed is the 1985 Annual Operations and Progress Report for the White River Shale Project (WRSP), prepared by the White River Shale Oil Corporation (WRSOC). During 1985 there were no construction related activities; however, reclamation of the construction dump (2.3 acres) was conducted.

As you are aware, the White River Shale Project has relinquished its oil shale leases to the Federal government. Because of this recent change, the project will soon cease. We anticipate that no additional construction, operation or maintenance activities will take place, and therefore a 1986 annual report will not be necessary.

Should you have any questions concerning these documents or our change in status, please contact us for assistance.

Yours truly,

Lowell B. Page
Project Director

LBP:seh
Enclosures

MR Form 3
(Revised 1984)

ANNUAL OPERATIONS AND PROGRESS REPORT

From Month/Year January 1985
to Month/Year December 1985

(To be submitted for each mining operation at the end of each calendar year to the Division at this address:)

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
(801) 538-5340

OPERATOR: White River Shale Oil Corpora- MINE NAME: _____
tion as agent on behalf of Phillips Petroleum Company, Sun Shale Oil Company and Sohio Oi
ADDRESS: Project Field Office, P.O. Box 790040 Company
Vernal, Utah 84079

PERMIT NUMBER AND DATE OF PERMIT: ACT/047/017 September 2, 1982

REPRESENTATIVE: Lowell B. Page

SECTION(S): 12-14, 19-30, 33, 34 TOWNSHIP(S): 10S RANGE(S): 24E, SLM Utah
18, 19 10S 25E, SLM Utah

MINERAL(S) MINED: Oil Shale

STATE AND/OR FEDERAL MINERAL LEASE NUMBERS: Federal Prototype Oil Shale Leases
Tract U-a (Lease No. U 25918); U-b (Lease No. U 26194)

SPECIAL USE PERMITS AND/OR RIGHTS-OF-WAY: Run-off retention dam & pond ROW (12/10/82);
Building permit for decline exhaust fan; 404 Permit for rip-rapping; Refer to attach-
ment Table 1 for complete listing of WRSP permit, approvals and notifications received.

Section 40-8-15 and Rule M-8 of the Utah Mined Land Reclamation Act, requires each operator to include with this report an up-dated map and plan prepared in accordance with Rule M-3, as outlined in the requirements for annual report maps in Appendix I, providing a detailed status of all mining and reclamation activities which have occurred during the past year.

The report should include:

MINING:

(a) Tabulation of acreage disturbed (by pits, roads, facilities, etc.) during the report period with illustration on a current map.

<u>Disturbance</u>	<u>Acreage</u>
Pit	-
Roads	-
Facilities	-
Waste Dumps	-
Other	-

(b) Tabulation of acreage affected to date (by years).

<u>Date by Year</u>	<u>Acreage (Total)</u>	<u>Cumulative Total Acreage</u>
1977		-
1978		-
1979		-
1980		-
1981		-
1982	127	127
1983	34	161
1984		161
1985		161

(c) Tabulation of all topsoil (new) stockpile volumes (see chart below) and date of stockpiling.

SOIL TABULATION CHART

		Area
Area Affected (in mining sequence) (If more space is needed, please attach.)		1 2 3 etc.
Acreage of Area		
Depth of Topsoil Removal (inches)	Variable.	Refer to topsoil depth isopachs w/ Topsoil Management Plan
Depth of Topsoil Replacement (inches)*		8-10 inches
Estimate of Topsoil Volume Salvaged (yd ³ or ac ft)		266,000 cu. yds.
Volume Actually Salvaged (yd ³ or ac ft)		214,000 cu. yds.
Volume Required for Reclamation (yd ³ or ac ft)		149,700 cu. yds. minimum
Surplus or Deficit Volume (yd ³ or ac ft)		38,000 cu. yds. minimum
Storage Status (short- or long-term)		180,540 cu. yds.

Soil Tabulation Chart (continued)

See page 3a attached

Area Affected (in mining sequence)	Area			
	1	2	3	etc.
Storage Location	Refer to attached map for location of <u>topsoil stockpiles</u>			
	TSL-1, TSL-2, TSL-3, TSS-1			
Area Where Soil Has Been Used (if not stored)	Decline portal access road & Mine			
	Service Bldg. pad; White River Access Rd. Runoff Retention Dam/Pond area.			
Running Total (all stockpiles) (yd ³ or ac ft)	180,540 cu. yds.			
Short-term	1,300 cu. yds.			
Long-term	179,240 cu. yds.			

*Of previously stripped area recently reclaimed.

(d) Tabulation of all (newly removed) out-of-pit spoil volumes, date of placement and illustration on a map.

<u>Area</u>	<u>Date</u>	<u>Acreage</u>
None		

(e) Tabulation of quantity of commodity mined.

	<u>Commodity</u>	<u>Tonnage</u>
(Mined)	None	
(Milled)	None	

(f) Description of any new construction during the report period with illustration on a map, including, but not limited to:

- Buildings and support facilities.

None

- Roads.

None

Soil Tabulation Chart Notes

1. Topsoil Salvaged= topsoil used for reclamation (33,700 cu/yds)
plus topsoil currently stockpiled (180,540
cu/yds.)
2. Topsoil required for covering disturbed areas not yet claimed
(127 acres) to a depth of 8 inches.
3. Surplus Topsoil= Volume stockpiled (180,540 cu/yds) - volume
required for reclamation (149,700) cu/yds) = Short Term Stockpile
(1,300 cu/yds).

3. Diversion ditches, collector ditches, interceptor ditches, etc.
None

4. Culverts.
None

5. Sediment ponds, containment ponds.
None

6. Monitoring sites (vegetative, air quality, surface subsidence,
surface water or ground water, etc.).
Revegetation monitoring sites
(refer to attached maps)

7. Topsoil stockpiles.
None

(g) Description of any environmental problem areas with a proposed plan
for mitigation and illustration on a map, including, but not limited to:

1. Pit stability problems.
None

2. Subsidence.
None

3. Date of seeding during the report period.

Spring _____

Fall Seeding performed during October

4. Seeding procedures used.

(Hand broadcast or drilled or any other).

Drill

5. Rate of seed application.

Pounds Per Acre of Pure Live Seed (PLS) (if varied, please explain)

Fall: approximately 10 lb/ac PLS - temporary mix

6. Type and rate of fertilizer applied.

Fall: approximately 30 lb/ac 10-30-10

7. Type and rate of mulch applied.

None

8. Rate of irrigation water applied, if any. Please describe any type of sprinkling, or water applied (water truck, etc.).

None

9. Revegetation test plot information.

(Cover, density, productivity, etc.)

See attached tables and figures

10. Soil analysis results.
None

(d) Description of results of previous revegetation efforts, including:
(This should be done as applicable.)

1. Types (species) of seed that have germinated and are growing.
Western wheatgrass; Russian wildrye; Nezpar; Indian ricegrass;
scarlet globemallow; Rocky Mountain penstemon; rubber rabbitbrush

2. Types (species) of seed that are not growing successfully.
None

3. Areas experiencing problems with weeds and weed types.
All areas experience spring weedy annual species

4. Significant erosional problems.
Cutslopes along roads: soil does not stay. Some
1984 seeding poor.

5. Areas of unsuitable overburden on the surface as related to
revegetation failure.
None

6. Procedures used or proposed to correct these problems.
Consider reseeding in the fall of 1986 if spring evaluation (1986)
of reclamation warrants

7. Acreage and dates of release (upon inspection by the State) of revegetated areas.

<u>Area</u>	<u>Date</u>	<u>Acreage</u>
N/A		

8. Results of soil analysis.

N/A

(e) Summarization of the reclamation costs incurred during the report period, including itemized costs for each operation (i.e., grading, topsoil replacement, seeding, etc.) and for each type of disturbance (i.e., spoil, haul roads, facilities removal, etc.) on a per acre basis.

	<u>Acres</u>	<u>Cost/Acre</u>
1. Grading		
2. Backfilling		
3. Contouring	2.3	\$105
4. Topsoil Replacement		
5. Seeding	6.1	\$905
A. Seedbed Preparation		
B. Mulch		
C. Fertilizer		
D. Seed		
6. Other		

BOND INFORMATION:

- A. An updated bond estimate should be included, if required in the Division's approval of the Mining and Reclamation Plan (MRP) or if changes to the MRP have occurred, including a detailed itemization of actual/estimated reclamation costs as outlined in the RECLAMATION section above. The date of the release of revegetated areas from further responsibility for a partial bond release, if applicable, should also be included.

	<u>Amount</u>	<u>Type</u>	<u>Date Posted</u>
Present Bond	4,400,000	Surety Bond	Combined BLM & DOGM on 3/1/85

Increased disturbance, if any:

Increased Bond Amount (attached reclamation estimate).

B. Bond release.

<u>Acres</u>	<u>Bond Amount Released</u>	<u>Date</u>
None	None	

ADDITIONAL INFORMATION:

Supply any additional information as requested by the Division related to:

- (a) Permit stipulations (status).
(b) Other special conditions (status).

1. Revised WRSP Topsoil Management Plan submitted February 4, 1983.
2. Program for on-site control over disturbed acreage submitted February 18, 1983.
3. Approval to Expand Limits of Work Area to 470 Acres received February 18, 1983.
4. 1982 Annual Operations and Progress Report submitted March 8, 1983.
5. Notification for Decline Transfer Service Borehole submitted April 18, 1983.
6. Analysis of samples from mine entries submitted June 14, 1983.
7. Quarterly Reports on Disturbed Acreage submitted for first, second, third and fourth quarters 1983.
8. Notification of Permanent Power Routing submitted June 10, 1983.
9. Notification of riverbank stabilization activities along the White River, submitted October 20, 1983.

APPENDIX I

ANNUAL REPORT MAPS

1. Maps must be clear and legible contour maps or recent aerial photos. The scale should be 1 inch = 500 feet to adequately show topographic features.
2. Map sheets should be of a reasonable size, not to exceed 48 inches on a side.
3. Maps must have a title block with:
 - A. Map title.
 - B. Name and address of permittee.
 - C. Permit and amendment numbers.
 - D. Annual report period.
 - E. Scale, north arrow, contour interval, date of photography, etc.
4. All maps must show:
 - A. Legal subdivisions.
 - B. Permit area boundary clearly shown and labelled.
 - C. Amendment areas clearly shown and labelled.
 - D. Contour features.
5. The following features should all be clearly identified:
 - A. Topsoil stockpiles (numbered and with volumes).
 - B. Settling ponds and sediment control structures.
 - C. Haul roads.
 - D. Pits identified by location, name, number, etc.
 - E. Ramps (numbered).
 - F. Out-of-pit spoil dumps.
 - G. All waste disposal sites including, but not limited to:
 1. Landfill sites.
 2. Carbonaceous waste dumps.
 - H. Diversion ditches.
 - I. Monitoring sites.
6. All areas to be affected by mining and reclamation in the coming year should be outlined and labelled.

TABLE 1

Permits/Approvals Acquired as of 12/5/83

1. Core Drilling TUP-BLM (8/24/81)
2. Authorization to Drill (shaft core drilling) - Utah Division of Oil, Gas, and Mining (9/15/81)
3. Authorization to Investigate (shaft core drilling) - Utah Division of Water Rights (9/24/81)
4. Endangered Species Biological Assessment/Clearance - USFWS (9/15/81)
5. Temporary Application to Appropriate Water (shaft core drilling) - Utah Division of Water Rights (10/21/81)
6. Approval for Tract Access Road Roadbed Width - Oil Shale Office (10/26/81)
7. Raw Shale Storage TUP-BLM (11/2/81)
8. Authorization for a Test Well (alluvial well exploration) - Utah Division of Water Rights (2/25/82)
9. Temporary Application to Appropriate Water (alluvial well exploration) - Utah Division of Water Rights (2/19/82)
10. NPDES Exemption (alluvial well exploration) - EPA (2/26/82) - verbal approval
11. Construction Permit (alluvial well exploration) - Utah Bureau of Water Pollution Control (2/16/82)
12. Geotechnical Shaft Coring Status Report - Utah Division of Oil, Gas, and Mining (1/28/82)
13. DDP - OSO (3/2/82)
14. Tract Access Road - OSO notification (3/15/82)
15. Tract Access Road - UBAQ notification (3/16/82)
16. Alluvial Well Exploration Plan - OSO (3/22/82)
17. Temporary Application to Appropriate Water (site geotechnical coring and tract access road) - Utah Division of Water Rights (4/2/82)
18. Interim Construction Camp - Uintah County notification (4/8/82)

Permits/Approvals Acquired as of 12/5/83

Page 2

19. Interim Construction Camp - OSO approval (4/19/82)
20. Site Geotechnical Investigation - OSO approval (4/23/82)
- 21, 22, 23. Archaeological Clearance for Site 42UN407 - OSO, BLM, Utah Division of State History (4/29/82)
24. Off-tract Geotechnical Investigation - BLM TUP (5/3/82)
- 25, 26, 27. Use of P-1 Holding Pond for Access Road Construction Water - Verbal approval from Utah Division of Water Rights (5/6/82), Utah Bureau of Water Pollution Control approval (5/6/82), OSO approval (5/11/82)
- 28, 29. Mine Decline Transfer Point Test Core - OSO Approval (6/8/82) and Utah Division of Oil, Gas and Mining Approval (6/8/82)
30. Exploratory Drilling in Hell's Hole Canyon - Utah Division of Oil, Gas and Mining Approval of Letter of Intention to Commence Exploratory Drilling (6/8/82)
31. Interim Approval for mine related site prep associated with mine access road, production decline and related shaft areas, and mine services building - Utah Division of Oil Gas and Mining (7/8/82)
32. Temporary Application to appropriate water (250 acre-feet, for Phase I construction activities) - Utah Division of Water Rights (7/9/82)
33. OSO Approval for 25,000 yards of borrow for tract access road (7/14/82)
34. Uintah Basin Health Dept. approval of Interim RV Camp sewage system (verbal approval on 7/14/82)
35. Mine Services Building - OSO notification (7/15/82)
36. OSO approval to proceed with mine related site prep as sought in WRSOC's 5/24/82 letter (verbal approval 7/16/82)
37. Mine services building - plan approval from Uintah County Zoning Office (7/22/82)

Permits/Approvals Acquired as of 12/5/83

Page 3

38. Oil Shale Office approval to revegetate side slopes along the tract access road using WRSOC's proposed seed mix (8/2/82)
39. Approval to proceed with production well program (i.e., 404 permit not required) from U. S. Army Corps of Engineers (8/3/82)
40. OSO notification of plans to drill production wells (8/3/82)
41. Archaeological clearance for production well area and related access road - BLM (8/4/82)
42. PSD Permit - Utah Bureau of Air Quality (8/4/82)
43. Notification of plans to discharge pump test waters directly to White River - OSO (8/9/82)
44. TUP for Northwest Quarter of Southwest Quarter of S15, R24E, T10S - BLM (8/10/82)
45. Notice of Intent to Commence Mining given - MSHA (8/10/82)
46. UDOGM approval for 10,000 yards of borrow from retention pond area (8/13/82)
47. Approval to discharge production well pump test waters directly to the White River - EPA Region VIII (8/19/82)
48. MSHA I.D. No. received (8/23/82)
49. Permit to Drill Production Wells - Utah Division of Water Rights (8/30/82)
50. DOGM Phase I Mining Permit (9/2/82)
51. Permit to discharge production well pump test waters to White River and to use existing holding pond - Utah Bureau of Water Pollution Control (9/8/82)
52. Approval for 13.2 KV Electrical Distribution System - OSO (9/13/82)
53. Approval of Subsidence Mitigation Plan - OSO (9/15/82)
54. County Building Permit for water, sewer and electric utilities exterior to mine services building - Uintah County (9/16/82)

Permits/Approvals Acquired as of 12/5/83

Page 4

55. Approval for Potable Water System for RV Camp - Uintah County Health Dept. (verbal approval after inspection 9/24/82)
56. Approval for Non-hazardous Solid Waste Disposal Plan - Utah Bureau of Solid Waste (9/30/82)
57. Utah Bureau of Public Drinking Water Approval for Potable Water Distribution System (10/1/82)
58. County Building Permit for Electrical Distribution System (10/16/82)
59. OSO Approval for Sewage Treatment System (10/19/82)
60. UBAQ Approval to Operate Temporary Mine Construction Equipment (10/20/82)
61. Declaration of Exemption for Hell's Hole Sampling Operation - Utah Division of Oil, Gas and Mining (10/20/82)
62. BLM Right-of-Way for Communications Tower on Blue Mountain (10/22/82)
63. Building Permit for Microwave Tower and Equipment Building and Water Truck Loading Facility (10/23/82)
64. OSO Approval for Mining Plans as Described in DDP Update (10/29/82)
65. Utah Bureau of Water Pollution Control Construction Permit for the Runoff Retention Pond and Dam (11/1/82)
66. OSO approval for Runoff Retention Pond and Dam (11/1/82)
67. Utah Bureau of Water Pollution Control Construction Permit for sewage lines and effluent holding pond associated with the RBC sewage treatment facility (11/1/82)
68. Utah Bureau of Water Pollution Control "Conceptual Approval" for the RBC Sewage Treatment Facility (11/1/82)
69. USFWS/BLM Approval of Raptor Protection for 13.2 KV Powerline (11/8/82)
70. Modification to Water Well Layout - OSO (11/12/82)
71. Building Permit for Decline Portal Retaining Wall (11/15/82)
72. FAA Notice of Landing Area Proposal for Helipad (11/15/82)

Permits/Approvals Acquired as of 12/5/83

Page 5

73. Division of Oil, Gas and Mining Approval for an Additional 30 Acres of Disturbance Beyond 110 (11/30/82)
74. Uintah County Building Permit for Utility System which includes Sewage Treatment Plant, Water Treatment Plant, Substation and Switchgear Plant, and 750 KV Transformer (12/1/82)
75. Construction Permit from Utah Bureau of Public Water Supply for Potable Water Treatment Facility (12/3/82)
76. TUP for Retention Dam and Pond (12/6/82) - BLM
77. Microwave Radio License (received December 7, 1982, effective October 29, 1982) - FCC
78. Uintah County Building Permit for Runoff Retention Pond and Dam and Temporary Structures (12/7/82)
79. Right-of-Way for Retention Pond and Dam (12/10/82) - BLM
80. Uintah County Building Permit for Site Preparation not covered in previous building permits (12/13/82)
81. Uintah County notice indicating that conditional use permit application is complete and adequate (12/20/82)
82. Plan Approval for Runoff Retention Pond and Dam (12/21/82) - Utah State Engineer
83. Utah Bureau of Water Pollution Control Construction Permit for RBC Sewage Treatment System (12/23/82)
84. Utah Bureau of Water Pollution Control Construction Permit for Runoff Retention Pond for Mine Services Building Area (12/23/82)
85. OSO/BLM Approval for Project Signs (12/23/82)
86. County Building Permit for additional mine related temporary structures (1/25/83)
87. UBWPC approval to discharge BNA water quality test waters (1/27/83)
88. Utah Division of State History Archaeological Site Assessment and Clearance (2/1/83)

Permits/Approvals Acquired as of 12/5/83

Page 6

89. TUP for clay borrow area test pits - BLM (2/4/83)
90. Corp of Engineer's approval to stabilize river bank under the provisions of the Nationwide Permit for Bank Stabilization (2/8/83)
91. OSO approval for Bank Stabilization Plans (2/10/83)
92. DOGM approval to expand limits of work area to 470 acres (2/18/83)
93. Clay Borrow Permit - BLM (3/7/83)
94. Permit to Appropriate Runoff for Retention Dam and Pond - Utah Division of Water Rights (3/25/83)
95. EPA approval to discharge BNA water quality test waters (4/15/83)
96. DOGM notification of decline transfer point service bore hole and access road (4/18/83)
97. Temporary application to appropriate water thru 7/1/84 - Utah Division of Water Rights (4/22/83)
98. Uintah County Building Permit for dryhouse and office trailer (4/26/83)
99. OSO approval for decline transfer point service bore hole and access road (5/6/83)
100. UBAQ approval for installation and operation of 5145 HP of diesel fired electric generating capacity (6/6/83)
101. Uintah County Building Permit for temporary shaft dry house, slope walker shed and diesel generator shed (6/7/83)
102. OSO approval for construction of Visitor Center (6/27/83)
103. Uintah County Building Permit for two temporary generator trailers (7/13/83)
104. Conceptual concurrence for UIC Permit Application-UBWPC (7/13/83)

Permits/Approvals Acquired as of 12/5/83
Page 7

105. OSO approval for Runoff Retention Dam Monitoring Plan (7/14/83)
106. NPDES Permit for Runoff Retention Dam - EPA (issued 9/27/83, effective 11/2/83).
107. UBWPC Water Quality Certification for Bank Stabilization Activities (11/10/83).
108. OSO approval for Bank Stabilization Activities (11/15/83).
109. Draft 404 Permit for Bank Stabilization Activities - U.S. Army Corps of Engineers (11/28/83).

Additional Permits/Approvals Acquired as of 3/31/85

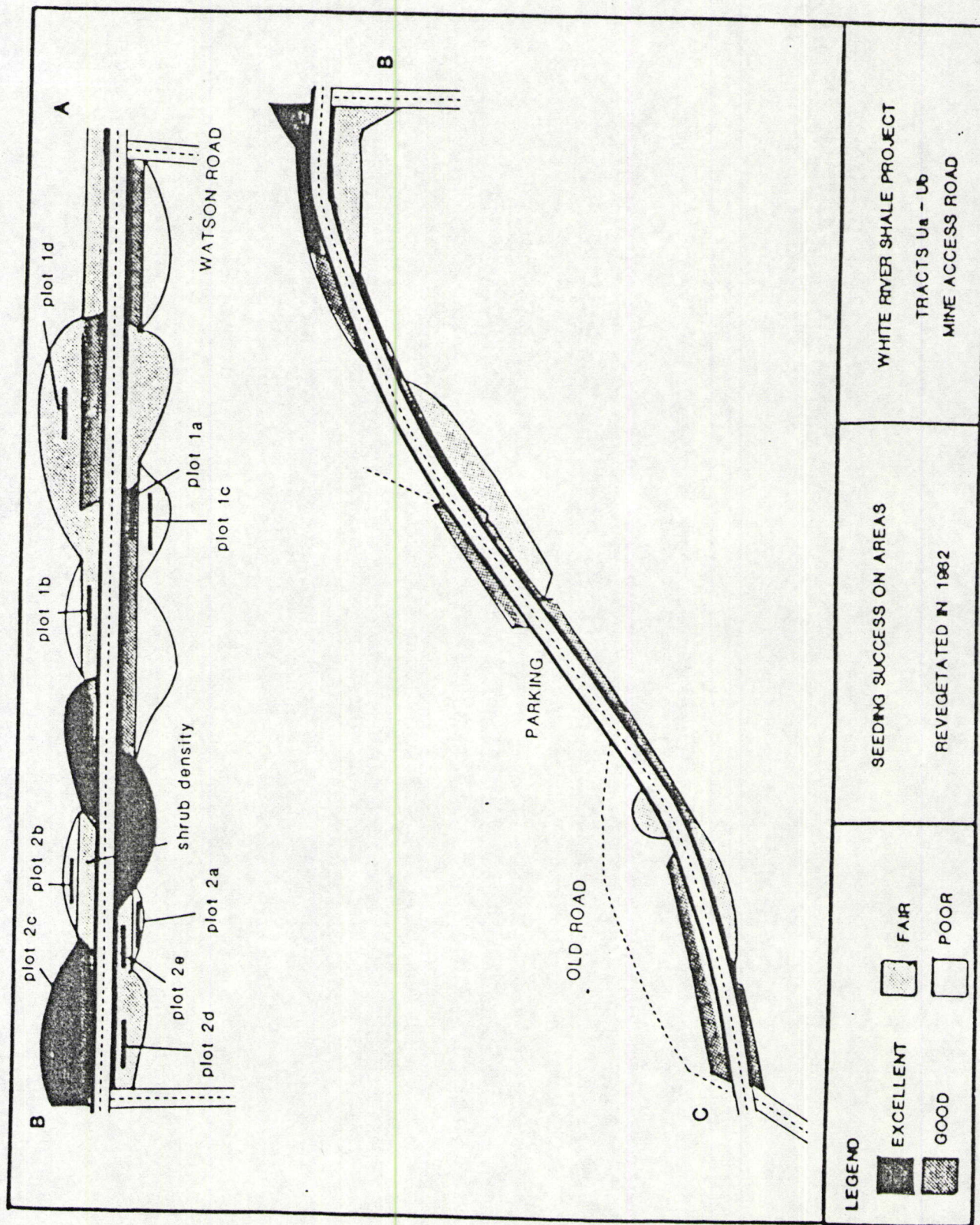
110. Department of the Army permit for placing riprap on the banks of the White River - COE (issued 12/9/83)
111. Uintah County Building permit for hoist house and decline exhaust fan - (issued 8/10/84)
112. WRSP revised DDP (submitted 17 July 1984)

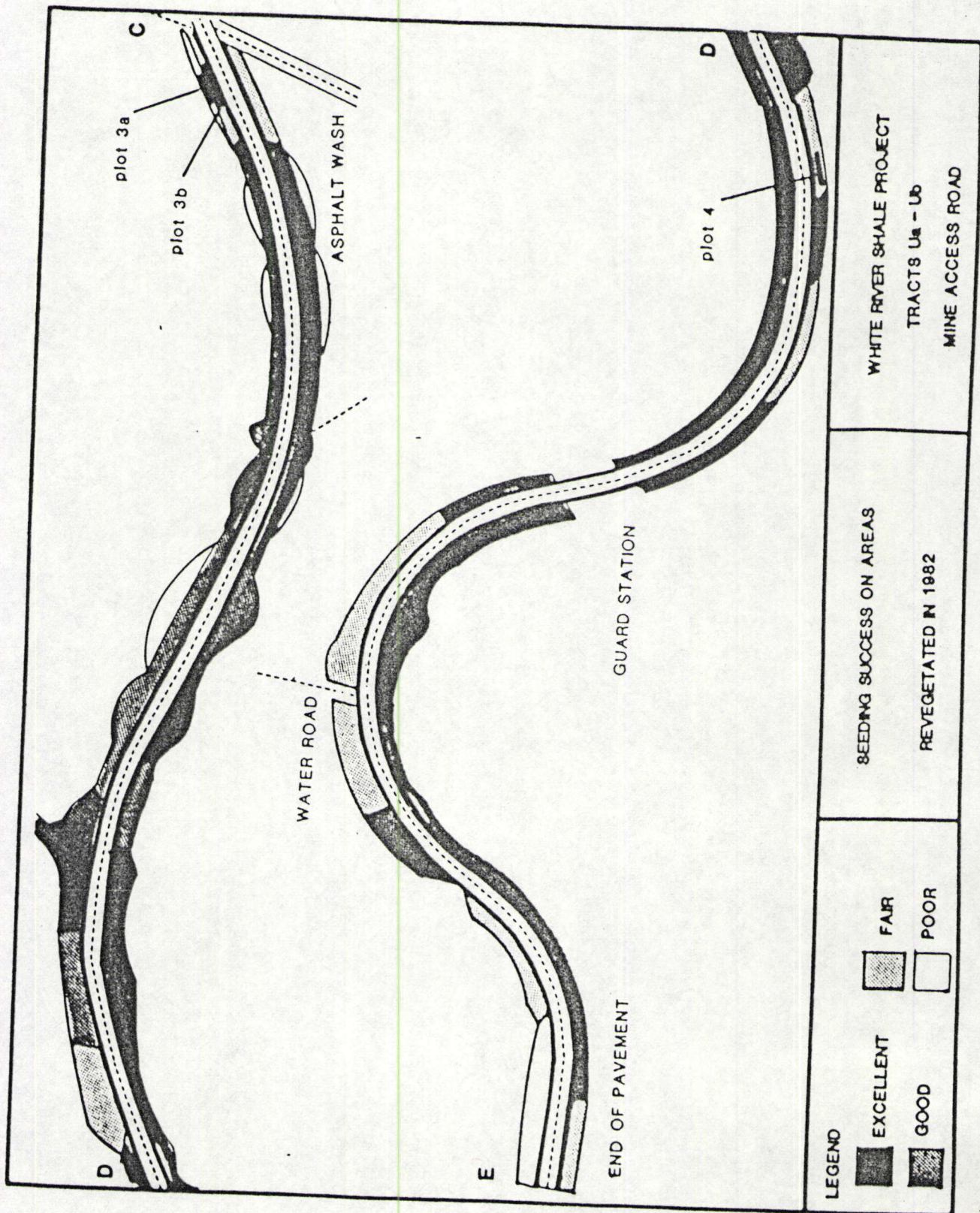
TABLE 2

Permit Application/Approval Request/Plans Submitted to Cognizant
Agency as of 12/5/83

1. DDP Update - OSO (9/3/82)
2. Right of Way Application for electric power line transmission system - BLM (6/10/83)
3. OSO approval for electric power line routing across Tract Ua (6/10/83)

Areas revegetated in 1982 along main mine access road. Area begins at the Watson road turnoff and continues to the end of the pavement.





WHITE RIVER SHALE PROJECT

TRACTS Ua - Ub

MINE ACCESS ROAD

SEEDING SUCCESS ON AREAS

REVEGETATED IN 1982

LEGEND

EXCELLENT



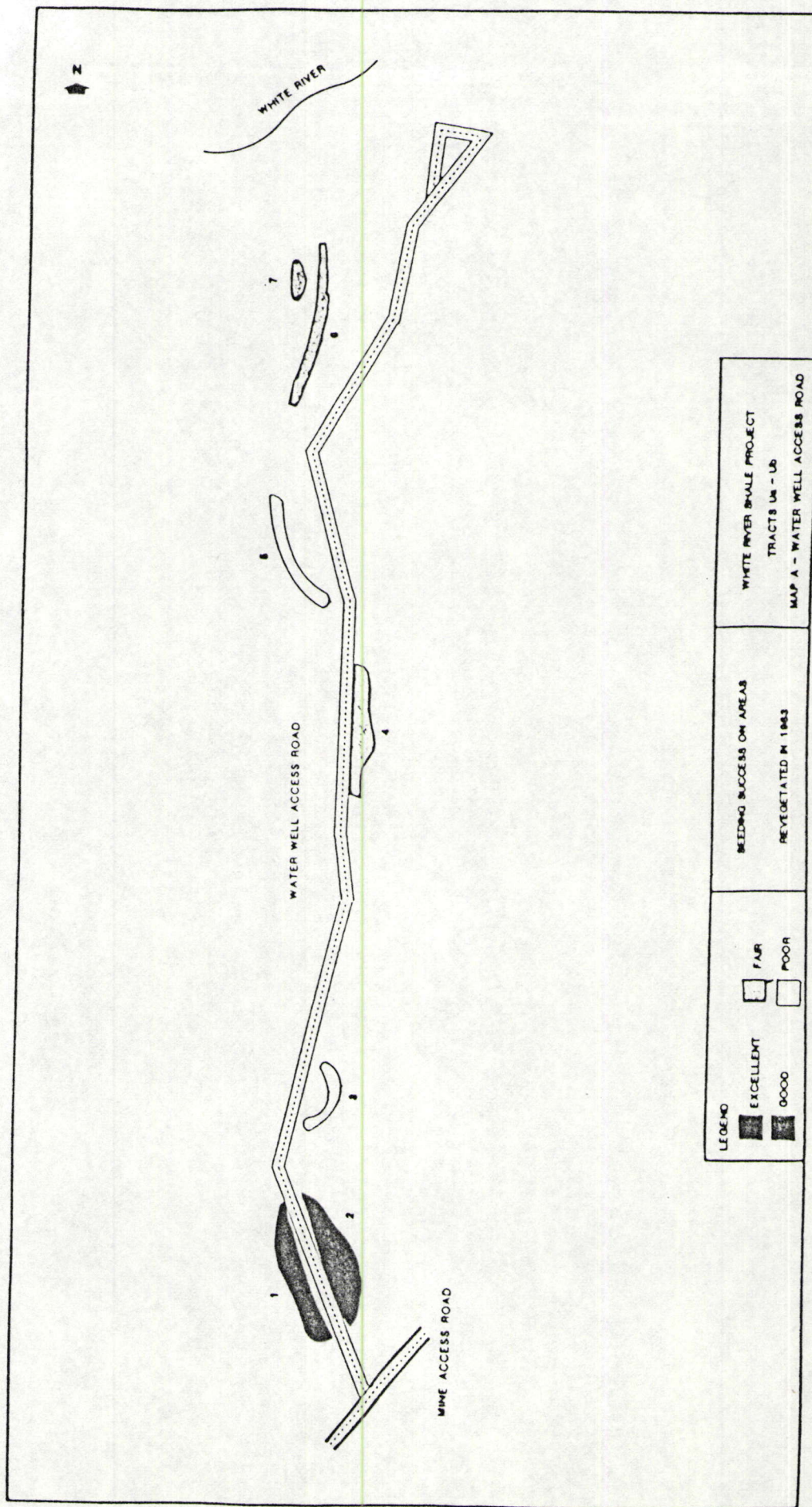
FAIR

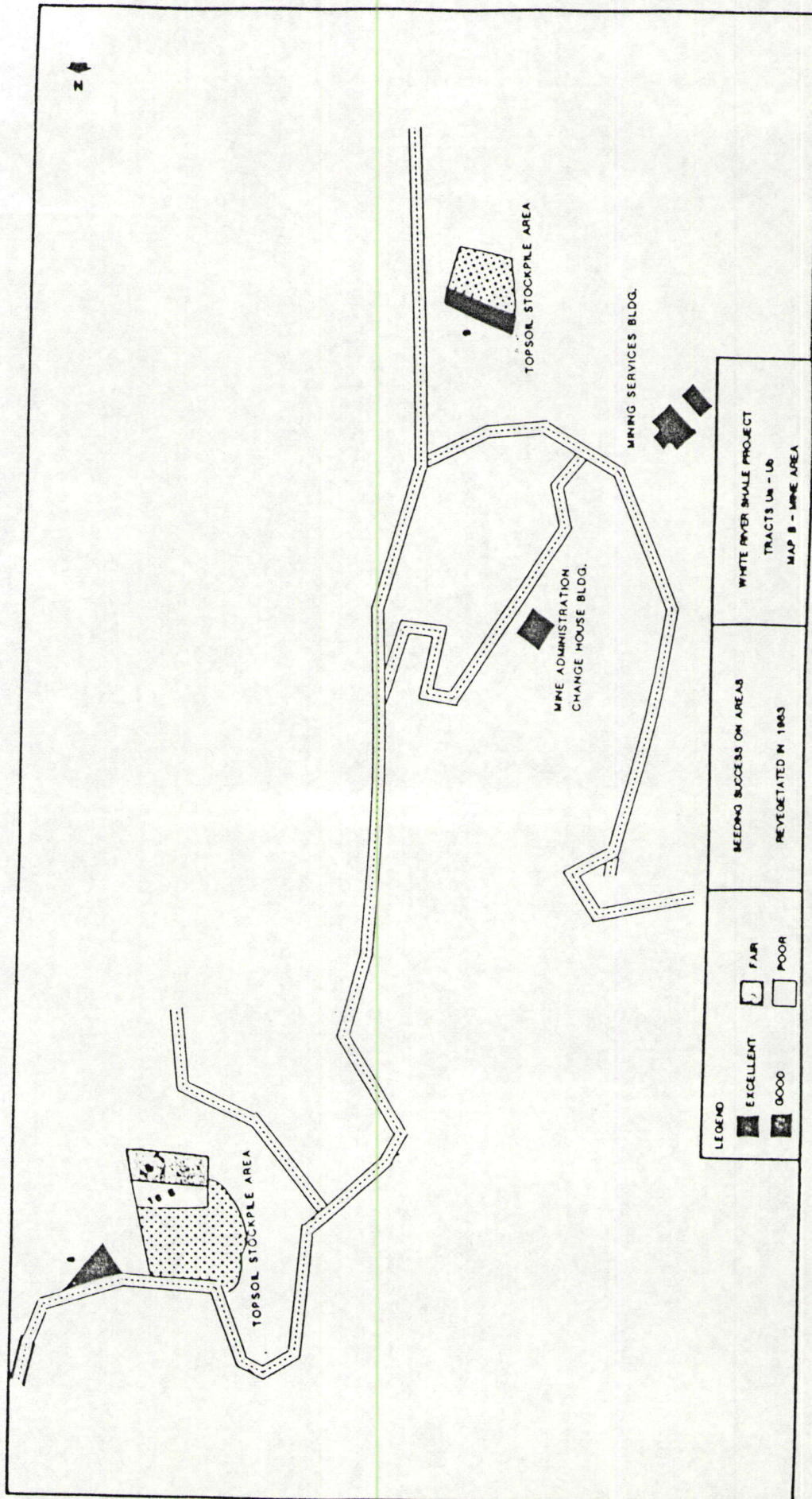


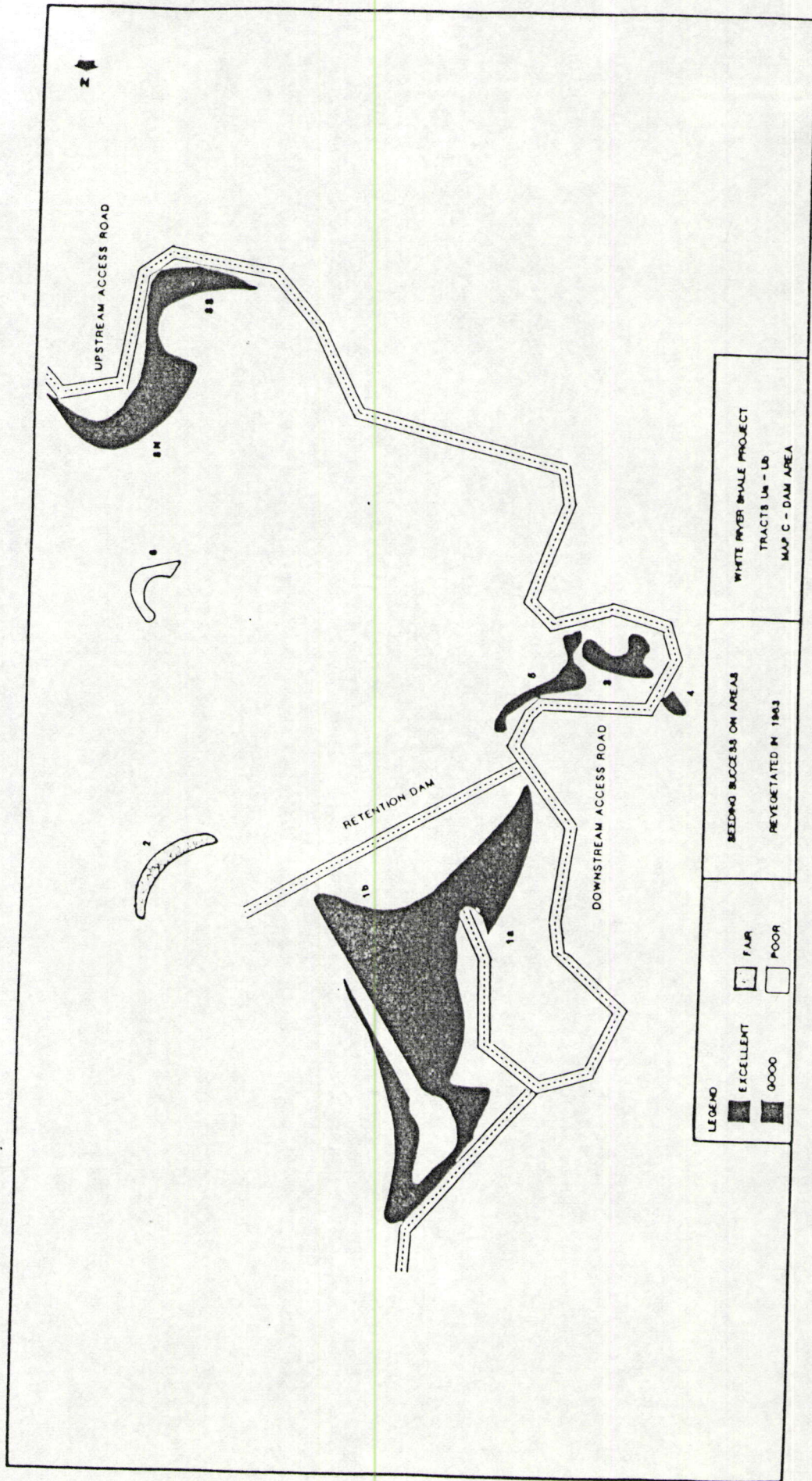
POOR

GOOD

Areas revegetated in 1983. Map A - Water well access road. Map B - Mine area. Map C - Retention Dam Area.







Plant cover and density (seedlings/m²) by species at 12 revegetation monitoring plots along main access road to plant site, October 1985.

Fall 1985

Site No: Treatment	1a B+E	1b W	1c W	1d FW	2a CW	2b CE	2c FW	2d FE	2e BE	3a CE	3b BE	4 BE
Species:												
ARTR	0.5						3.5	1.5	0.5	0.5	2.0	5.5
ATCA	0.5	0.5		0.5			1.0	0.5				0.5
ATCO	0.5						0.5			0.5	0.5	1.5
CHGR												
Total Shrub	1.5	0.5	0	0.5	0	0.5	5.0	2.0	0.5	1.0	2.5	7.5
AGCR												
AGSM	55.0	26.0	1.0	1.0			17.0		39.0	8.0	24.5	16.5
CRHY	4.0		1.0	1.5	0.5		0.5		2.0	0.5	0.5	3.5
Total Grass	59.0	28.0	2.0	2.5	0.5	0	17.5	0	41.0	8.5	25.0	20.0
Seeding Success*												
	Excel	Excel	Poor	Fair	Poor	Poor	Excel	Poor	Excel	Good	Excel	Excel
Cover												
Total	19.1	8.8	1.9	3.6	1.3	5.3	15.6	14.3	29.4	2.8	9.1	13.4
% Perennial	79	54.4	2.6	16.9	12.5	0.0	50.6	16.9	50.6	23.1	58.8	82.4
Total Bare-ground	66.8	76.5	16.8	39.3	11.25	23.9	68.6	65.8	44.5	92.5	69.3	68.3

1-B = Borrow; F = Fill; Slope; C = Cut Slope

2-E = East Aspect; W = West Aspect

*Vallentine (1974)

Plant cover and density (seedlings/m²) by species at revegetation monitoring plots, October 1985.

Species	Water Well Access Road									
	1-A		2-A		3-A		4-A		5-A	
	Oct 84	Oct 85	Oct 84	Oct 85	Oct 84	Oct 85	Oct 84	Oct 85	Oct 84	Oct 85
Shrubs:										
ARTR	6.0	4.0	7.0	1.5			3.0	8.0		
ATCA	1.0	1.5	1.0	0.5				2.5	0.5	
ATCO	2.5	3.5	2.0	0.5				1.5		
ATCOR	1.0	1.5	1.0							
ATCU	2.0	0.5	2.0	1.0						
CELA	0.5									
CHNA	0.5		0.5							
ATSPP.			0.5					0.5		
Total Shrub	13.5	11.0	14.0	3.5	0	0	3.0	12.5	0	1.5
Grass							1.0			
AGSM	9.5	14.0	3.5	4.0	1.5	7.0	2.0	4.0	5.0	1.5
ORHY	12.5	17.5	5.0	4.5	0.4	3.5	0.5	12.0	1.0	2.0
ELJU		0.5							1.5	2.0
Total Grass	22.0	32.0	8.5	8.5	1.9	10.5	2.5	16.0	6.0	30.0
Seeding Success	Excel	Excel	Excel	Excel	Poor	Excel	Fair	Excel	Poor	Fair
Cover										
Total	*	12.1	*	7.8	*	10.4	*	3.8	8.8	*
% Perennial	*	85	*	42	*	9	*	64	25	*
Bareground	*	85.1	*	89.4	*	87.3	*	91.3	78.8	*

* Data not taken

Continued

Species	Mine Access Road					
	8-B		16T-B		16S-B	
Shrubs:	Oct 84	Oct 85	Oct 84	Oct 85	Oct 84	Oct 85
ARTR	0.5	2.0				
ATCA			0.5			
ATCO	0.5	0.5				
ATCOR		0.5				
ATCU		0.5		1.0		
CELA						
CHNA						
ATSP						
Total Shrub	1.0	3.5	0.5	1.0	0	0
Grass						
AGSM	65.0	16.5	3.5	2.0		36.0
ORHY	6.0	5.5	0.5	1.0		
ELJU				1.5		
Total Grass	71.0	25.5	4.0	4.5	0	36.0
Seeding Success	Excel	Excel	Fair	Good	Poor	Excel
Cover						
Total	*	11.3	*	4.5	*	7.3
% Perennial	*	93	*	29	*	62
Bareground	*	84.4	*	94.0	*	90.1

* Data not taken

Continued

Retention Dam Area

Species	1a-C		1b-C		2-C		3,4,5-C		6-C		8s-C		8n-C	
	Oct	Oct	Oct	Oct	Oct	Oct	Oct	Oct	Oct	Oct	Oct	Oct	Oct	Oct
	84	85	84	85	84	85	84	85	84	85	84	85	84	85
Shrubs:														
ARTR			10.4		1.0	1.0	1.0	0.5	0.5	0.5	1.0	0.5	0.5	3.0
ATCA	0.8		4.0		0.5	0.5	0.5				1.0	0.5	1.0	0.5
ATCO	1.6	1.5	4.8		1.5	1.0		1.0			2.0	2.0	1.5	1.0
ATCOR	1.6	3.5	2.4	1.0	0.5	0.5	0.5	2.5			0.5	2.0	2.0	1.5
ATCU	4.8	0.5	9.6		1.0	0.5	0.5	1.0			0.5	0.5	2.5	0.5
CELA	2.4		5.6								0.5	0.5		
CHNA					0.5	0.5	0.5	0.5		0.5				
ATSP.			0.8				0.5	0.5			1.5		1.5	
Total Shrub	11.2	5.5	37.6	1.0	4.5	4.0	3.0	6.0	0.5	0.5	7.0	6.0	9.0	6.5
Grass														
AGSM	16.0	35.5	19.2				14.5	21.0	1.0	3.5	3.5	8.0	3.0	6.5
ORHY	73.6	19.5	18.4	1.0			16.5	9.0	0.5	3.5	2.5	2.5	5.0	4.5
ELJU	0.8	1.0		2.5				0.5		0.5				
Total Grass	90.4	56.0	37.6	3.5	0	0	31.0	30.5	1.5	7.5	6.0	10.5	8.0	11.0
Seeding Success	Excel	Excel	Excel	Fair	Fair	Fair	Excel	Excel	Poor	Good	Excel	Excel	Excel	Excel
Cover														
Total	*	16.7	*	7.5	*	13.0	*	15.6	*	13.1	*	14.6	*	6.3
% Perennial	*	67	*	24	*	11	*	79	*	63	*	69	*	55
Bareground	*	81.1	*	57.5	*	41.4	*	79.5	*	85.8	*	81.0	*	91.6

* Data not taken

Vegetation cover and plant density (plants/m²) by species on areas seeded in the fall of 1983.

<u>Species</u>	<u>Spring 1984</u> 8 plots sampled	<u>Fall 1984</u> 17 plots sampled	<u>Fall 1985</u> 16 plots sampled
<u>Shrubs:</u>			
ARTR	2.9	1.8	1.1
ATCA	1.7	0.6	0.3
ATCO	1.4	1.1	0.5
ATCOR	0.4	0.6	0.8
ATCU	0.0	1.3	0.3
CELA	0.0	0.5	0.1
CHNA	0.4	0.1	0.2
ATSPP.	0.2	0.3	0.0
Total Shrub	7.0	6.3	3.2
<u>Grass</u>			
AGSM	0.0	9.6	9.4
ORHY	0.5	8.8	5.1
ELJU	0.0	0.2	0.5
Total Grass	0.5	18.6	18.8
Overall Seeding Success	Excellent	Excellent	Excellent
<u>Cover</u>			
Total	*	*	8.3
% Perennial	*	*	40.9
Bareground	*	*	66.7

* Data not taken